SCIENCE LIBRARY
GENERAL LIBRARY
MAR 15 1920
UNIV. OF MICH.

VOL. 47 FEBRUARY 1920 NO. 2

BULLETIN

OF THE

TORREY BOTANICAL CLUB

Editor

ALEXANDER WILLIAM EVANS

Associate Editors

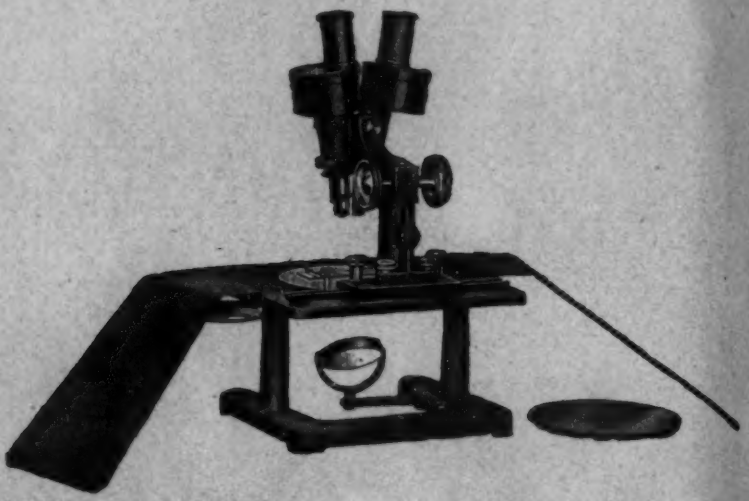
JEAN BROADHURST
JAMES ARTHUR HARRIS
MARSHALL AVERY HOWE
MICHAEL LEVINE
GEORGE ELWOOD NICHOLS
ARLOW BURDETTE STOUT
NORMAN TAYLOR

CONTENTS

Notes on Rosaceae—XII . . . . . PER AXEL RYDBERG 45
Rare species of North American Diatomaceae. (Plate 2.) CHARLES S. BOYER 67
The wood of Machaerium Whitfordii . . . . . ROBERT B. MILLER 73
INDEX TO AMERICAN BOTANICAL LITERATURE 81

PUBLISHED FOR THE CLUB
THE NEW ERA PRINTING COMPANY
LANCASTER, PA.

Large Dissecting Stand



A recent design which meets every requirement by reason of its large size and wide range of usefulness. Accommodates interchangeably Binocular Microscope body (illustrated), Monocular Erecting Body, using medium high power objectives, or simple lens in jointed arm—all focused by rack and pinion. The microscope bodies may be mounted on a sliding track, permitting the entire width of the stage to be covered.

Stage, 8 x 7 inches, is provided with glass and metal plates, 4¾ inches in diameter, and with adjustable background stops beneath.

With 38 and 19 mm. doublet lenses $39.00

With Binocular Microscope body, 40 mm. objectives and 10X eyepieces, as illustrated above 103.50

Write for illustrated circulars.

Bausch & Lomb Optical Co.

NEW YORK WASHINGTON SAN FRANCISCO
CHICAGO ROCHESTER, N. Y. LONDON

Please mention the "Bulletin" when answering advertisements.

Vol. 47 No. 2

BULLETIN

OF THE

TORREY BOTANICAL CLUB

FEBRUARY, 1920

Notes on Rosaceae—XII

PER AXEL RYDBERG

ROSES OF NORTHEASTERN NORTH AMERICA

By northeastern North America is meant the parts of the United States and Canada east of the Mississippi River and the Lake of the Woods and north of North Carolina and Tennessee. It comprises about the same region as that covered by Gray's and Britton's manuals, except the extreme western portion included in the latter.

As the genus *Rosa* is too large to be treated in one paper, my intention has been to discuss the different species according to their distribution, in six or seven articles. One of these articles, entitled "Roses of California and Nevada,"* has already been published; the roses of the Rocky Mountain Region have been described in my Flora,† and the whole genus, as represented in North America, has been monographed in the North American Flora.‡ There is, therefore, no need of giving full descriptions or of citing lists of synonyms. For the sake of those who do not have access to the later publication, it may be desirable to include keys to the species. The articles will otherwise contain only such notes as could not be included in the North American Flora.

---

*Bull. Torrey Club 44: 65–84. 1917.

†Flora of the Rocky Mountains and adjacent plains. New York. 1917.

‡N. Am. Flora 22: 483–533.

[The BULLETIN for January (47: 1–44, *pl. 1*) was issued February 18, 1920.]

Key to the groups

Styles much exserted, united, about equaling the stamens; stipules adnate; sepals reflexed, deciduous; stem climbing, with curved prickles. I. SYNSTYLAE.

Styles not exserted, or only slightly so, distinct; stigmas forming a head closing the mouth of the hypanthium.

Stipules almost free from the petioles; introduced climbers or trailers. II. BRACTEATAE.

Stipules for most of their length adnate to the petioles; plants rarely climbing.

Sepals after flowering reflexed and soon deciduous.

Achenes inserted both on the inner walls and in the bottom of the hypanthium; prickles rarely infrastipular.

Stem prickly.

Leaflets 3–5, rarely 7, large, round; stem with both scattered prickles and bristles; flowers mostly solitary. III. GALLICAE.

Leaflets mostly 7; stem with strong prickles, very rarely with bristles. IV. CANINAE.

Stem unarmed. VI. CINNAMOMIAE.

Achenes inserted only in the bottom of the bristly hypanthium; stem with infrastipular prickles and usually with numerous bristles on the young shoots. V. CAROLINAE.

Sepals after flowering erect, connivent, long-persistent on the fruit; achenes inserted both on the inner walls and in the bottom of the hypanthium.

Flowers corymbose or, if solitary, then supported by a bract; leaflets large.

Stem with scattered prickles, rarely with intermixed bristles; sepals more or less lobed; foliage glandular-punctate, sweet-scented (in *R. rubiginosa* and *R. tomentosa*). IV. CANINAE.

Stem, at least the young shoots, bristly; prickles infrastipular or lacking; sepals entire or the outer sometimes with one or two lobes; foliage not very sweet-scented. VI. CINNAMOMIAE.

Flowers solitary, bractless; leaflets very small. VII. PIMPINELLIFOLIAE.

I. SYNSTYLAE

Stipules pectinate. 1. *R. multiflora.*

Stipules entire or denticulate.

Leaflets glabrous or slightly pubescent on the veins beneath, dark green and shining above. 2. *R. setigera.*

Leaflets velutinous-pubescent beneath, rather dull above. 3. *R. rubifolia.*

1. ROSA MULTIFLORA Thunb.

This species is a native of Japan and China. It is extensively cultivated, and has developed into numerous horticultural varieties, mostly with double flowers. Numerous hybrids have also been produced. It has become naturalized in Alabama and on Porto Rico, and is otherwise found occasionally escaped in the Southern States. Within the area covered by this paper, there is a simple record from Maryland. The species is distinguished from its relatives by the fringed stipules.

2. ROSA SETIGERA Michx.

This is a native of the Southern States and is common from North Carolina and Kentucky to Alabama and Florida. It is found, however, outside of this range as far west as Kansas and Arkansas. The following localities north of Kentucky have been recorded. The specimens collected at these places might have been from plants escaped from cultivation.

NEW YORK: Oneida, *Maxon;* Ithaca, *Coville.*

3. ROSA RUBIFOLIA R. Br.

This species has been regarded as the same as the preceding. In its typical form, however, with its broader and thicker leaflets densely pubescent beneath, it seems quite distinct. The few intermediate forms seen by the author may have been hybrids. *R. rubifolia* has its best development in the Mississippi Valley and is rare east of the Alleghanies. It extends further north than *R. setigera*. The following specimens are here recorded from outside of the range proper. These may have been collected from escaped plants, as this species, as well as *R. setigera*, is extensively cultivated.

NEW JERSEY: Milburn, *Mackenzie.*

ONTARIO: Sandwich and Pelee Island, *Macoun.*

II. BRACTEATAE

One species. 4. *R. bracteata.*

4. ROSA BRACTEATA Wendl.

A native of China, often cultivated and occasionally escaped and naturalized from Virginia to Florida and Texas. It is well

understood and no specimens need to be cited. The only synonyms the author has found, are: *R. lucida* Lawrence, and *R. Macartnea* Dum. Cours. The former is a hyponym and a homonym. The latter has often been given as a synonym of *R. laevigata*, but erroneously so, for it is easily seen from Dumortier's description that it belongs to *R. bracteata*.

III. GALLICAE

One species. 5. *R. gallica.*

5. ROSA GALLICA L.

Cultivated in many forms and occasionally escaped. Some of these escaped specimens may belong to the pure-blooded *R. gallica*, but others are plainly referable to *R. centifolia*. Whether or not the latter is a distinct species is a question which I have had neither the time nor the inclination to settle. The following specimens, belonging to *R. gallica* or closely related species, have been recorded within the area.

NEW YORK: New Baltimore, *N. Taylor.*

WISCONSIN: *Stennett.*

IV. CANINAE

Leaflets glandular-pruinose beneath, distinctly double-serrate with gland-tipped teeth.
- Leaflets suborbicular or broadly oval, mostly rounded at the apex; hypanthium in fruit obovoid or broadly ellipsoid, abruptly contracted at the apex; sepals tardily deciduous or more or less persistent; styles pubescent. 6. *R. rubiginosa.*
- Leaflets ovate or oval, acute or short-acuminate; hypanthium in fruit narrowly elliptic, tapering at both ends; sepals rather early deciduous; styles glabrous or nearly so. 7. *R. micrantha.*

Leaflets not glandular beneath, except sometimes on the midrib; teeth only occasionally double.
- Leaves pubescent, at least beneath, and on the rachis. 8. *R. dumetorum.*
- Leaves glabrous on both sides, shining above. 9. *R. canina.*

6. ROSA RUBIGINOSA L.

The Sweetbrier is often cultivated and has become thoroughly naturalized in many places. It is very variable in cultivation and the naturalized specimens show also such variation. All specimens labeled *R. rubiginosa* do not, however, belong to that species. At least one-fourth of them belong to the next.

7. ROSA MICRANTHA Borrer

This is often mistaken for *R. rubiginosa* but differs in the less rounded leaflets, the more ellipsoid fruit, the more deciduous sepals, the smaller petals, and the almost glabrous styles. The following specimens belong to it:

MASSACHUSETTS: Manchester, *Chamberlain;* Ipswich, *Morong.*

NEW YORK: Oak Point, *Burnham 77;* High Bridge, *Elizabeth Knight;* Fort Lee, *Torrey Botanical Club.*

NEW JERSEY: Rocky Hill, *Lighthipe;* Great Notch, *Nash 1056.*

MARYLAND: Rush River, *Shull 347.*

VIRGINIA: Bedford, *A. H. Curtiss.*

8. ROSA DUMETORUM Thuill.

Closely resembling the Dog Rose but with the leaves pubescent beneath. The only record of this species from America is one from Bowling Green, Kentucky. This might have been an escape from cultivation.

9. ROSA CANINA L.

The Dog Rose is well understood, though it is only sparingly naturalized in the Northeastern States.

V. CAROLINAE

Hypanthium globose or short-ellipsoid, rounded or barely acute at the base.
  Infrastipular prickles decidedly curved.
    Leaflets finely serrulate, elliptic or oblanceolate; prickles short and stout.
      Leaflets mostly 7; flowers usually corymbose on erect branches; fruit depressed-globose, about 12 mm. thick. 10. *R. palustris.*
      Leaflets mostly 5; flowers usually solitary or two together on spreading branches; fruit ellipsoid, acute at the base, 8–9 mm. thick. 11. *R. dasistema.*
    Leaflets coarsely serrate, oval or obovate.
      Leaflets not shining; prickles short and weak.
        Leaflets obovate; fruit 10–12 mm. in diameter. 12. *R. gemella.*
        Leaflets oblanceolate; fruit 7–10 mm. in diameter. 13. *R. nanella.*
      Leaflets shining; prickles long and stout. 14. *R. virginiana.*
  Infrastipular prickles straight or slightly curved.
    Leaflets oval or obovate or broadly lance-elliptic, 5–7 (in *R. virginiana* rarely 9).

Leaves decidedly pubescent beneath.	15. *R. Lyoni.*
Leaves glabrous or pubescent only on the veins beneath.	
Leaflets shining above; flowers usually corymbose; prickles as a rule stout and flattened at the base.	14. *R. virginiana.*
Leaflets not shining above; flowers usually solitary, rarely a few together; prickles slender, terete.	
Leaflets not glandular-dentate.	
Plant low, usually less than 2 dm. high; leaflets less than 2 cm. long, dark green; prickles 3–5 mm. long, stout, often curved.	13. *R. nanella.*
Plant usually more than 2 dm. high; leaflets usually more than 2 cm. long; prickles more than 5 mm. long, slender.	
Leaflets broadly oval.	16. *R. obovata.*
Leaflets elliptic or narrowly oval.	17. *R. carolina.*
Leaflets glandular-dentate and rachis usually glandular.	18. *R. serrulata.*
Leaflets narrowly elliptic or lance-oblong, usually 9–11, at least on the new shoots.	19. *R. nitida.*
Hypanthium decidedly pyriform, or ellipsoid, long-tapering at the base.	20. *R. Bicknellii.*

10. ROSA PALUSTRIS Marsh.

This has usually been known as *Rosa carolina* L. It is the *R. carolina* of the second edition of Linnaeus's Species Plantarum, but not that of the first. It is evident that Linnaeus, when he prepared the manuscript for the first edition, did not have any specimens, but based his *R. carolina* wholly on the plate and description in Dillenius's Hortus Elthalmensis, *pl. 245, f. 316.* This plate does not represent *R. carolina* as usually understood, but the species commonly known as *R. humilis* Marsh. In discussing *R. carolina*, Crépin states: "The latter description, i.e., that of Hortus Elthalmensis, and the figure can apply either to *R. humilis* Marsh. or to *R. lucida* Ehrh., but not to *R. carolina* as we know it today. Besides the branch which I have seen in Sherard's herbarium with Dillenius's name on, belongs to *R. humilis* Marsh (= *R. parviflora* Ehrh.). The result is that the first name for *R. humilis* Marsh. is *R. carolina* L. Sp., ed.1." Crépin therefore arrived at the same conclusion as I. The oldest

name for the Swamp Rose, or what has usually been known as *R. carolina*, is thus *R. palustris* Marsh., a very appropriate name. The synonymy of this species is much involved; see North American Flora.

West of Lake Michigan, especially in the Green Bay region, *R. palustris* has more pubescent, smaller, and less bluish green leaflets. This form may represent a distinct species or geographical variety.

11. ROSA DASISTEMA Raf.

Some specimens, collected especially in Missouri and named *R. carolina*, differ from *R. palustris* in having a smaller hypanthium decidedly pear-shaped and acute at the base, instead of depressed-globose and rounded below, and also in having fewer leaflets, usually five, rarely seven, instead of seven or nine. These specimens agree closely with the description of *R. dasistema* Raf. The type of the latter was from Indiana, from which state I have seen no specimens. This fact, however, does not disprove the identity of the Missouri specimens with Rafinesque's species. These specimens are:

MISSOURI: Paw Paw Junction, *Bush 226;* Kennett, *Trelease 177;* Campbell, *Bush 109, 6214;* Butte County, *Bush 3688.*

12. ROSA GEMELLA Willd.

Although this has usually been regarded as a synonym of *R. blanda*, the description shows that it can not be that species. The description of the prickles of *R. gemella* (slender and curved) would exclude it from *R. blanda*. There is, however, a plant, though rather rare, which answers Willdenow's description. It is related to *R. carolina*, but differs in the curved prickles, the more corymbose inflorescence, and the entire sepals. It may be confused also with *R. virginiana* and *R. palustris*. From the former it differs in the thin dull leaflets, the slender more curved prickles and the low habit. Its prickles resembles those of *R. palustris* but are much weaker, while its leaflets are broad and rather short and more coarsely serrate. The following specimens belong here:

NOVA SCOTIA: Yarmouth, *Howe & Lang 122.*

MASSACHUSETTS: Ipswich, *Nash, Morong;* Provincetown, *Hollick.*

NEW YORK: South Beach, Staten Island, *Burnham 746;* New Dorp, *Kearney;* Eastport, *Schrenk.*

VIRGINIA: Marion, *N. L. & E. G. Britton & A. M. Vail.*

13. ROSA NANELLA Rydberg

Mr. E. P. Bicknell collected a small rose on the sand-dunes of Chappaquiddick Island, east of Martha's Vineyard, Massachusetts, which was described in the North American Flora under this name. It is related to *R. carolina*, but smaller, has smaller leaflets, smaller fruit, and short, usually curved prickles. It also resembles *R. nitida*, especially in the small shining leaflets, but the latter are fewer in number and more obovate, and its prickles are different. The following specimens belong here:

MASSACHUSETTS: Chappaquiddick Island, *Bicknell.*

NEW YORK: Peconic River, Long Island, *N. Taylor;* Smith's Point, Fire Island, *E. L. Morris;* Oak Island, *N. Taylor.*

14. ROSA VIRGINIANA Mill.

This has usually been regarded as a synonym of *R. blanda.* This may have been due partly to the fact that Miller described *R. virginiana* as unarmed, partly perhaps to the fact that at least one of the specimens on which *R. blanda* was originally based belonged to the species here treated. Another character assigned to *R. virginiana* by Miller, viz., "the shining leaves," does not very well apply to *R. blanda* as usually understood. The name *R. virginiana* Mill. was substituted for *R. lucida* Ehrh. in the New Gray's Manual by Robinson and Fernald. I therefore wrote to Professor Fernald, asking him kindly to let me know the reasons for the change made. In answer I received the following letter, which I take the liberty of publishing:

Rosa virginiana Miller, Gard. Dict. ed. 8, no. 10 (1769), is represented by a fine sheet in the herbarium of the British Museum, marked "*Rosa virginiana* Mill. Dict. No. 10!" James Britten and J. G. Baker who called my attention to it say there is absolutely no question about its authentity. There are three fruiting branches and they are perfectly good *R. lucida* Ehrh. Crépin recognized it and has written on the sheet "*R. lucida* Ehrh. Cr." and J. G. Baker (Jour. Linn. Soc. XXXVII. 74) in his Revised Classification of Roses so treats it. I took a photograph—an excellent one nearly life-size—and it shows the characteristic broad-base and curved infra-stipular prickles at two points.

It is therefore plain that *R. virginiana* Mill. is the oldest name for the rose usually known as *R. lucida* Ehrh. To me it seems that *R. carolinensis* Marsh. applies better to this species than does either of the two species described by Linnaeus under the name of *R. carolina*. *R. rapa* Bosc is apparently a double form of this species.

Mr. Best reduced this species to a variety of *R. humilis*. He had collected a great number of rose-specimens in New Jersey. Some of these were presented to Columbia University. These show many gradations between *R. lucida* Ehrh. and *R. humilis* Marsh. (i.e., the original *R. carolina* L.), and also between these and another form, *R. humilis villosa* Best (*R. Lyoni* Pursh). Best concluded that all should be regarded as a single variable species. He has been followed by N. L. Britton and C. K. Schneider, the latter using the name *R. virginiana lucida* Best. I doubt if Best ever used said combination, at least in print. In my opinion several of Mr. Best's specimens are of hybrid origin, and this circumstance would give a satisfactory explanation for the intergradation, which is rarely met with elsewhere.

Rosa blanda Willmottiana Baker, according to the figure, has nothing to do with *R. blanda*, but belongs without doubt to *R. virginiana*.

15. ROSA LYONI Pursh

A species which has been confused with both *R. virginiana* Mill. (*R. lucida* Ehrh.) and *R. carolina* L. (*R. humilis* Marsh.), but which differs from both in having the leaves densely pubescent beneath. In general habit and in the sepals and the prickles, it resembles most the latter, but the leaflets are much broader and the flowers are as large as in *R. virginiana*. The flowers are also more inclined to be corymbose than in *R. carolina*. *R. Lyoni* is a more western species, receiving its best development in Missouri, but extends as far east as central New York and New Jersey, where it mixes with the two species mentioned, and hybridizes with them. See remarks under *R. virginiana*. *R. Lyoni* is apparently the same as *R. pusilla* Raf., *R. lucida* α T. & G., and *R. humilis villosa* Best.

16. ROSA OBOVATA Raf.

The first one to give a good description of this species was Lindley, who described it in his monograph under the name *R. laxa*. Unfortunately this name was preoccupied by *R. laxa* Retz., for which reason Sprengel substituted *R. Lindleyi*, also a homonym or rather pseudo-homonym, as there was already a *R. Lindleyana* Tratt. Mr. Baker, in Miss Willmott's Genus *Rosa*, described it as *R. humilis grandiflora*. There is, however, a *R. grandiflora* Salisb., so the name is not available. The only name left to consider is *R. obovata* Raf. Rafinesque's description, in this case as usually, is far from satisfactory, but "the single large flowers, obovate leaflets, and straight prickles," would indicate this species. In many respects it is intermediate between *R. virginiana* and *R. carolina*, but has comparatively broader leaflets than either. The leaflets are rather dull, sometimes somewhat glaucous. The following specimens are to be referred to it:

MAINE: Hudson, *Briggs;* Bangor, *O. W. Knight.*

MASSACHUSETTS: Nantucket Island, *Bicknell.*

RHODE ISLAND: Newport, *Mearns 553.*

NEW YORK: Ithaca, *Coville, Pearce;* Long Beach, Long Island, *Bicknell;* Lake Ronkonkoma, *Bicknell.*

NEW JERSEY: Bay Head, Ocean County, *Mackenzie.*

PENNSYLVANIA: Raymond's Kill, Pike County, *Nash.*

MISSOURI: Chadwick, *Trelease 185.*

17. ROSA CAROLINA L.

This name was taken up in the North American Flora for the plant described by Linnaeus in the first edition of his Species Plantarum. It is the same as *R. humilis* Marsh. and *R. parviflora* Ehrh. See the discussion under *R. palustris*. Wangenheim described it under the name *R. pennsylvanica*, and Michaux changed the form of the name to *R. caroliniana*. It appears also to be *R. pratensis* Raf. The rest of the synonyms are easily explained.

18. ROSA SERRULATA Raf.

This is closely related to the preceding species and has usually been confused with it. It differs in the double-toothed leaflets,

each tooth usually ending in a distinct gland. In the South it is more common than *R. carolina*, but extends as far north as central New York and Wisconsin. It is the same as *R. parviflora glandulosa* Crépin, and also as his var. *setigera*, at least in part.

19. ROSA NITIDA Willd.

This is well understood. It is distributed from Newfoundland to Massachusetts, near the coast, and has likewise been collected in Connecticut.

20. ROSA BICKNELLII Rydberg

This species is probably most closely related to *R. virginiana* but differs in the smaller and less numerous flowers, the obovoid fruit acute at the base, the smaller, thinner, and not shining leaflets. It may be the same as *R. acuminata* Raf., but the leaflets are by no means "acuminate," and the distribution, as far as known, is quite different. The following specimens belong to it:

NOVA SCOTIA: Purchell's Cove, Halifax Harbor, *Howe & Lang*.

MASSACHUSETTS: Coscati and Wauwinet, Nantucket Island, and Chappaquiddick Island, *Bicknell*.

NEW YORK: Long Beach, East Rockaway and Lawrence, Long Island, *Bicknell;* Lone Hill and Peconic River, *N. Taylor*.

VI. CINNAMOMIAE

Infrastipular prickles not present; branches unarmed or bristly, not prickly.
- Inflorescence corymbose, terminating the stem; plant more or less suffruticose; stem very bristly, mostly dying back to the ground in the winter; leaflets usually 9–11.
  - Leaves glabrous or nearly so. — 21. *R. arkansana.*
  - Leaves densely pubescent, especially beneath. — 22. *R. suffulta.*
- Inflorescence of solitary or few corymbose flowers ending lateral branches; plant shrubby; leaflets usually 5 or 7 (or 9 on the new shoots only).
  - Stem densely bristly even in age.
    - Leaflets comparatively thin, neither rugose nor strongly reticulate; branches and prickles glabrous.
      - Hypanthium decidedly pear-shaped or ellipsoid, acute at the base, with a distinct neck at the top. — 23. *R. acicularis.*

Hypanthium subglobose, without a neck.	
Leaflets glandular-granuliferous and pubescent beneath; fruit 1.5 cm. thick.	24. *R. Bourgeauiana.*
Leaflets villous beneath; fruit about 1 cm. thick.	25. *R. acicularioides.*
Leaflets thick, strongly reticulate, and rugose; branches and even the prickles pubescent.	26. *R. rugosa.*
Stem unarmed or when young covered with more or less deciduous bristles.	
Sepals erect or connivent in fruit.	
Leaflets decidedly but finely pubescent beneath.	27. *R. blanda.*
Leaflets glabrous on both sides, shining.	28. *R. subblanda.*
Sepals reflexed in fruit.	
Leaflets decidedly puberulent or short-pilose; sepals 9–15 mm. long; petals 1.7–2 cm. long.	29. *R. Williamsii.*
Leaflets glabrous or nearly so; sepals 2–5 cm. long; petals 2.5–3.5 cm. long.	30. *R. johannensis.*
Infrastipular prickles present, more or less curved.	
Flowers mostly solitary; petals 2.5 cm. long or more: leaflets densely pubescent beneath.	31. *R. spinosissima.*
Flowers corymbose; petals about 2 cm. long; leaflets finely puberulent beneath.	32. *R. palustriformis.*

21. ROSA ARKANSANA Porter

Collected in Wisconsin.

22. ROSA SUFFULTA Greene

Collected near the Bureau of Standards, Washington, D. C. This and the preceding species belong to the prairies and plains west of the Mississippi River and will be treated in a subsequent article.

23. ROSA ACICULARIS Lindley

This species was originally described from Siberian material, but Alaskan specimens match exactly Lindley's figure and so do specimens from Siberia. Specimens from the southern and eastern limits of its range differ a little, in having smaller and less firm leaflets, less glaucous beneath, and smaller flowers. They differ from *R. Engelmannii* and *R. Bourgeauiana* in the leaflets, which are narrower and decidedly pubescent beneath; from the former in the simple teeth and the lack of glandular granules on the lower ieaf-surfaces, and usually in the larger fruit; and from the latter ln the elongate fruit with a distinct neck. All specimens from

Wisconsin, Michigan, and northern New York, labelled *R. Engelmannii* and many labelled *R. Sayi* belong here. *R. Sayi* Schwein. is in reality a synonym of this. See discussion under the next species. Sometimes *R. acicularis* is nearly destitute of bristles, and may then be mistaken for *R. blanda*, but the ellipsoid fruit always distinguishes it. Such specimens are:

MICHIGAN: Presque Isle Park, Marquette, *Wheeler* (determined by Crépin as *R. blanda*, with the following remark, "fruiting receptacle resembling that of *R. acicularis* var. *Engelmannii*").

24. ROSA BOURGEAUIANA Crépin

This was first collected by Richardson on the Saskatchewan or somewhere between that river and the Mackenzie, and was published as *R. majalis* Borrer in Hooker's Flora. There is an older *R. majalis* Herm., however. In 1875, Crépin proposed the name *R. Bourgeauiana*, without a description, but the next year he reduced it to a variety of *R. acicularis*. Watson, in his Monograph of the North American Roses, adopted the name *R. Sayi* Schwein, and it has usually been known under that name. It is not *R. Sayi* Schwein., however, for Schweinitz described his species as having ellipsoid fruit and the leaves pubescent beneath. These characters point without any doubt to *R. acicularis*, which is also found in the region visited by Schweinitz. *R. Sayi* must therefore be regarded as a synonym of *R. acicularis*.

25. ROSA ACICULARIOIDES Schuette

Schuette's description* is very meager, but the writer has seen some of his specimens. The description in the North American Flora was drawn from those in the Gray Herbarium. Later some were also found at the New York Botanical Garden, among duplicates from Schuette's herbarium, received in exchange from the Field Columbian Museum, Chicago. The plant perhaps most resembles *R. Bourgeauinana* in habit, leaf-form, and size and form of the fruit, but the leaflets are densely pubescent beneath as in *R. acicularis;* yes, even more so, and with longer hairs. The specimens are from Lily Bay, Sturgeon Bay, and Little Sturgeon, Door County, Wisconsin.

* Proc. Am. Ass. Adv. Sci. 46: 278–9. 1898.

26. ROSA RUGOSA Thunberg

Common in cultivation and occasionally found as an escape; it is well established in a few places in Connecticut and on Nantucket Island.

27. ROSA BLANDA Ait.

The species was based on three different elements, judging from the following statements in the Hortus Kewensis:

Nat. of Newfoundland and Hudson's-bay.
Cult. 1773, by Mr. James Gordon.

Fernald* has properly discussed the status of the two native specimens covered by the description. Having previously discussed the matter with him, the author agreed that the name must be applied to the Hudson Bay specimen, rather than the Newfoundland one, for the plant is named the "Hudson Bay Rose,"* and the hypanthium is described as glabrous. Prior to this discussion with Professor Fernald, I had held the opinion that the Newfoundland plant should be regarded as the type, partly because Solander, who prepared part of the manuscript for the first edition of Aiton's Hortus Kewensis, had in manuscript called this *R. blanda* and the Hudson Bay shrub *R. blanda* β; and partly because *R. blanda* is described as glabrous. I therefore adopted the name *R. Solanderi* Tratt. for the shrub usually called *R. blanda*, the species with pubescent leaves. Having conceded to Fernald's argument, I have left *R. blanda* as interpreted by Lindley. If the name *R. blanda* is applied to the Newfoundland plant, it would become a synonym of *R. virginiana* and be eliminated altogether.

In the Green Bay region of Wisconsin and Upper Michigan, *Rosa blanda* is much more pubescent than elsewhere, so far as I know, and the pubescence of the lower surface of the leaves is sometimes as as long as in *R. acicularis* and *R. acicularioides*. In some of these specimens the leaflets are more elongate-elliptic and the hypanthium more elongate, or pear-shaped, or with a distinct neck, and in such cases the specimens are probably of hybrid origin, i.e., represent *R. acicularis* × *blanda*. In the same region *R. palustris* is also more pubescent. Could, perhaps, some *R. acicularis* blood have been infused in both many generations back?

* Rhodora **20**: 90–96. 1918.

Lindley recognized a so-called glabrous *R. blanda* and described it under the name *R. fraxinifolia* Borkh., but Borkhausen's description does not agree with Lindley's conception of *R. fraxinifolia*. Neither does C. C. Gmelin's description,* which has been cited as a synonym of *R. blanda*. Lindley included in this *R. fraxinifolia* not only *R. blanda* α of Solander's manuscript, i.e., the Newfoundland rose, but also the *R. blanda* described and figured by N. J. Jacquin† The former is, as shown by Fernald, nothing but *R. virginiana* Mill. and belongs to a different group, the CAROLINAE, instead of the CINNAMOMIAE. Jacquin's *R. blanda* is probably the same as the cultivated specimens mentioned by Aiton. Jacquin described *R. blanda* as being perfectly glabrous both as to the leaves and the hypanthium. His illustration does not in any way indicate that his plant was *R. virginiana*. In nearly every respect, it suggests *R. blanda*, except that both the illustration and the text inform us that it was glabrous. Is there such a plant, and what name should it bear? As stated before, Lindley recognized such a plant, though he erroneously included in it *R. blanda* α of Solander, from Newfoundland, which had a glandular bristly hypanthium. Neither can the name which he adopted be used for the reason given above. Crépin, who had seen the original specimens of *R. blanda* α, and had written on the sheet "verus *R. lucida*," i.e., *R. virginiana*, recognized a glabrous *R. blanda*, and described it as *R. blanda glabra*. As this plant evidently has no valid name, I gave it the name *R. subblanda* in the North American Flora.

28. ROSA SUBBLANDA Rydberg

This species is much rarer than *R. blanda* and wholly confined to the Northeast. The following specimens may be cited:

QUEBEC: *Mrs. Persival;* Cape Enrage, Bic, *Williams, Collins & Fernald.*

VERMONT: Gardener's Island, Lake Champlain, *Faxon;* Royalton, *Eggleston.*

NEW YORK: Bluff Point, Lake Champlain, *Vail.*

* Fl. Bad. 2: 413. 1806.

† Fragmenta *pl. 107.* 1809.

29. ROSA WILLIAMSII Fernald

30. ROSA JOHANNENSIS Fernald

This and the preceding species have been discussed by their author,* and nothing more needs to be added.

31. ROSA SPINOSISSIMA L.

This is the earliest name for the Cinnamon Rose. Linnaeus probably included in the original description two different species, or at least cited also synonyms belonging to *R. pimpinellifolia.* Many authors have applied the name *R. spinosissima* to the latter species. It is evident that Linnaeus principally had in mind a native rose of Sweden, which could be none but the Cinnamon Rose.

Crépin† has shown that the original *Rosa cinnamomea* L., of the first edition of the Species Plantarum, which was based wholly on a plant from Switzerland and described by Haller and Bauhin, is the same as *R. pendulina* L. In the first edition Linnaeus gives as a synonym under *R. cinnamomea,* "Rosa sylvestris, odoratissimo rubro flore. *Bauh. pin.* 483." Under the same name, in the second edition, he cited, "Rosa, odore cinnamomi, simplex. *Bauh. pin.* 483," which shows that *R. cinnamomea* L. of the first edition was not the same as that of the second. The first was evidently what in the tenth edition of his Systema and in the second edition of his Species Plantarum is called *R. alpina,* which is the same as *R. pendulina* L.

The *R. cinnamomea* of the second edition is the plant usually known under that name. As stated before, the oldest name of this is evidently *R. spinosissima* L. Not that that name should be entirely equivalent to *R. cinnamomea* of the second edition, for Linnaeus evidently had two species confused. He gave two references under it, one to his Flora Suecica and the other to Bauhin's Pinax. The latter may well be *R. spinosissima* as usually understood, i.e., a form of *R. pimpinellifolia;* but the former must be something else. *R. pimpinellifolia* is not found, even as an escape, in the part of Sweden where Linnaeus reported his *R. spinosissima.* In his Flora Suecica, he gave the vernacular name

* Rhodora **20**: 94, 95. 1918.

† Bull. Herb. Boiss. **5**: 135–138. 1897.

of the plant in the province of Upland, north of Stockholm, and stated that it grew along margins of fields. Wahlenberg, both in his Flora Upsaliensis and in his Flora Suecica, identified it with *R. majalis* Retz. and *R. cinnamomea* Sm., which is the same as *R. cinnamomea* of the second edition of the Species Plantarum; he even adopted the name *R. spinosissima*.

In the tenth edition of his Systema, Linnaeus placed *R. spinosissima* in the second division, i.e., with the species having ovate fruit, while he placed *R. pimpinellifolia* in the first division with suglobose fruit. In the second edition of the Species Plantarum, he added nothing to what he had in the first edition except one sentence from the Systema. In his second Mantissa, he seems to have changed his views altogether. Under *R. pimpinellifolia* he made the following remark: "Cum *R. spinosissima* eadem facit *Hallerus*." Evidently on account of Haller's interpretation, he adopted the name *R. spinosissima* for *R. pimpinellifolia*. He omitted all his previous synonyms, cited "*Clus. hist.* 1. *p.* 116," and made a new description, incorporating in it not only a globose fruit, but white petals, yellow at the base, characters all belonging to *R. pimpinellifolia*.

Rosa spinosissima (*R. cinnamomea* of the second edition of the Species Platarum) is in cultivation, and has been found occasionally escaped in the northeastern part of this continent, and also in Wisconsin.

32. ROSA PALUSTRIFORMIS Rydberg

This species was discovered by Dr. Schuette of Green Bay, Wisconsin, who distributed it under an untenable manuscript name. In habit, pubescence and prickles, it strongly resembles *R. palustris*, but the hypanthium and sepals are in form and size like those of *R. blanda*. The sepals are erect and persistent in fruit, while the hypanthium is glabrous, not glandular-hispid. At first I thought that it might be a hybrid between the two species, but it has one feature not found in either—the sepals are wholly without glands on the back, only with a few gland-teeth on the margins. In both *R. palustris* and *R. blanda*, the sepals are glandular on the back. The description in the North American Flora was drawn from the specimens in the Gray Herbarium. Those

received later, which are in the herbarium of the New York Botanical Garden, do not resemble *R. palustris* so much, but the distinctive characters are there. Besides the Green Bay specimens, there is also one from Neenah, Wisconsin.

VII. PIMPINELLIFOLIAE

One species. 33. *R. pimpinellifolia.*

33. ROSA PIMPINELLIFOLIA L.

As stated before, Linnaeus included this species under *R. spinosissima* in the first edition of the Species plantarum, but it is not the type of it. See the remarks under *R. spinosissima.* Many recent authors have readopted the name *R. pimpinellifolia* for the present species. I am glad that the latter name, which has been in use for this species during a hundred and fifty years, is to be taken up again.

R. pimpinellifolia is extensively cultivated and has escaped in many places. It has been mistaken for a native more than once. Pursh described it as *R. lutescens,* and lately E. G. Baker has given it another name, *R. illinoensis.* The latter was based on specimens collected, according to Baker, by Green, Lansing and Dixon at La Salle, Illinois. There is a sheet in the herbarium of the New York Botanical Garden, collected by Greenman [not Green], Lansing and Dixon. Baker distinguished it from *R. spinosissima* (i.e., from *R. pimpinellifolia*) by the smaller number of leaflets, only seven and by the upper prickles being paired under the leaves. In our specimens, some leaves have nine leaflets, while some of the upper leaves have only three or five. We have also some specimens from England and Scandinavia, which do not have more than seven leaflets. The arrangement of paired infrastipular prickles, I think, was only incidental, for our specimens, duplicates of the type, do not show this characteristic. *R. illinoensis* is nothing but the escape of one of the numerous cultivated forms of *P. pimpinellifolia.* The following American species belong to this species:

VERMONT: Johnson, *Grout.*

ONTARIO: Amherstbough, *Macoun 34752.*

ILLINOIS: La Salle County, *Greenman, Lansing & Dixon 133.*

HYBRIDS

It is well known that hybrids among roses are very common in cultivation, and many wild hybrids have been recorded in Europe. No attempt has been made in this country until recently to distinguish hybrids among our native species. The first and only record in print that I know of, was made in 1900 and by a European, Crépin, who published *R. carolina* × *nitida* in Rhodora. This hybrid should now be known as *R. nitida* × *palustris*.

Outside of this record, I did not know of anyone besides myself and Mr. E. P. Bicknell, who had undertaken to distinguish hybrids among our native roses, and neither of us had put our observations in print. Bicknell, who did so much in clearing up the *Rubus* hybrids, did some work on *Rosa* at the same time, though his notes have remained in manuscript.

While spending some time last fall at the Gray Herbarium, I found there a collection made by Dr. Schuette of Green Bay, Wisconsin, which collection I worked over in the light of a small paper published by him in 1889.* After my return to New York, I found that the New York Botanical Garden had received a set of Dr. Schuette's duplicates in exchange with the Field Columbian Museum in Chicago. The numerous notes accompanying these duplicates, as well as those at the Gray Herbarium, show that Schuette had done considerably more intelligent work than his published paper indicated. In his article, he described one new species, *R. acicularioides*, and several varieties of *R. blanda* and *R. carolina* (i.e., *R. palustris*). His descriptions are meager, mostly one or two lines long, and apparently of little value, unless studied in connection with his specimens. His notes, however, show that most of his varieties he regarded as hybrids between those two species and other roses found in the region. The notes if published would make a long paper by themselves. It would not be advisable to do so now, as nobody could now present the matter with Schuette's final views. It is evident that even at the time when he published his paper, he was inclined to regard these forms as hybrids. It is unfortunate that he did not dare or did not think it advisable to put his convictions in print and

* Proc. Am. Ass. Adv. Sci. 46: 278–279. 1898.

publish them as hybrids instead of varieties. His published paper does not give justice to his knowledge of, and insight into, the relationship of the roses of Green Bay and vicinity.

It is hardly worth while to redescribe our rose hybrids in this paper. Anyone who wishes to avail himself of descriptions can find them in the North American Flora. I shall therefore only indicate which hybrids have been recorded and cite some specimens which I regard as belonging to each.

ROSA ACICULARIS × BLANDA

WISCONSIN: Sturgeon Bay, Fort Howard, Elkhart, Little Sturgeon, and Lily Bay, *Schuette.*

MICHIGAN: Menominee, *Schuette.*

ROSA ACICULARIS × CAROLINA

WISCONSIN: Little Sturgeon, *Schuette.*

ROSA ACICULARIOIDES × CAROLINA

WISCONSIN: Lily Bay, Door County, *Schuette.*

ROSA BICKNELLII × NANELLA

MASSACHUSETTS: Chappaquiddick Island, *Bicknell.*

ROSA BICKNELLII × VIRGINIANA

MASSACHUSETTS: Squam, Nantucket Island, *Bicknell.*

NEW JERSEY: Farmingdale, *N. Taylor.*

ROSA BLANDA × CAROLINA

WISCONSIN: Peak's Point, Green Bay, Marinette, Dutch Creek, Peshtigo, Preble, and Big Swamico, *Schuette.*

ROSA BLANDA × PALUSTRIS

WISCONSIN: Fort Howard, Marinette, Green Bay, Big Swamico, *Schuette.*

ROSA BLANDA × VIRGINIANA

ONTARIO: Point Abino, *Small;* Mt. Denis, *Biltmore Herbarium.*

MICHIGAN: Ann Arbor (collector unknown).

ROSA CAROLINA × PALUSTRIS

NEW YORK: Jamaica, *P. Wilson;* Sylvan Beach, Oneida County, *House.*

PENNSYLVANIA: Island Park, near Easton, and on the Delaware, *Porter.*

NEW JERSEY: Spotswood, *N. Taylor.*

WISCONSIN: Big Swamico and Preble, *Schuette.*

ROSA CAROLINA × VIRGINIANA

NEW JERSEY: Farmingdale, *N. Taylor.*

INDIANA: Boss Lake, *Deam.*

ROSA DASISTEMA × VIRGINIANA

MISSOURI: Butler County, *Eggert.*

ROSA JOHANNENSIS × PALUSTRIS

MAINE: Portage Lake, *Robinson & Fernald.*

ROSA LYONI × SERRULATA

VIRGINIA: Marion and Rye Valley, *Small.*

WEST VIRGINIA: Little Falls, *Millspaugh;* White Sulphur Springs, *Biltmore Herbarium.*

NORTH CAROLINA: Matthews, *Biltmore Herbarium.*

GEORGIA: Floyd County, *Chapman;* Coosa River, *Biltmore Herbarium.*

ROSA LYONI × VIRGINIANA

NEW JERSEY: Kingswood and Rosemont, *Best.*

ROSA NITIDA × PALUSTRIS

MAINE: Foxcroft, *Fernald.*

ROSA NITIDA × VIRGINIANA

NEWFOUNDLAND: St. George, *Howe & Lang.*

MASSACHUSETTS: Branch Island.

ROSA PALUSTRIS × SERRULATA

WISCONSIN: Fort Howard, *Schuette.*

ROSA PALUSTRIS × VIRGINIANA

MASSACHUSETTS: Nantucket Island, *Bicknell.*

NEW JERSEY: Palisades: *Southwick.*

ROSA SERRULATA × VIRGINIANA

ALABAMA: Monte Sano and Auburn, *C. F. Baker.*

The following table indicates the hitherto recorded hybrids among our northeastern native roses:

	Rosa palustris	*Rosa dasistema*	*Rosa nanella*	*Rosa virginiana*	*Rosa Lyoni*	*Rosa carolina*	*Rosa serrulata*	*Rosa Bicknellii*	*Rosa nitida*	*Rosa acicularis*	*Rosa acicularioides*	*Rosa blanda*	*Rosa johannensis*
Rosa palustris				×		×	×		×			×	×
" *dasistema*				×				×					
" *nanella*													
" *virginiana*	×	×			×	×	×	×	×			×	
" *Lyoni*				×			×						
" *carolina*	×			×						×	×	×	
" *serrulata*	×			×	×								
" *Bicknellii*			×	×									
" *nitida*	×			×									
" *acicularis*						×						×	
" *acicularioides*						×							
" *blanda*	×			×		×				×			
" *johannensis*	×												

NEW YORK BOTANICAL GARDEN

Rare species of North American Diatomaceae

CHARLES S. BOYER

(WITH PLATE 2)

Auliscus floridanus sp. nov.

Valves subtriangular. Central space not evident. Surface of the valve plane, indistinctly pruinose for two thirds of the radius and abruptly costate near the border, with sharply defined, coarse costae at irregular intervals, parallel between the processes but converging near them. Processes three, close to the border, irregular or triangular, with hyaline margins. Diameter 70 μ. [FIG. 3.]

TYPE LOCALITY: Mosquito Inlet, Florida.

DISTRIBUTION: marine; known from the type locality only.

Auliscus hyalinus sp. nov.

Valve subcircular, plane, slightly irregular. Central space appearing hyaline, about one third the diameter of the valve, indistinctly granular or pruinose toward the border where finely punctate, subtle, radiating striae are interspersed at irregular intervals with delicate, costate lines. Processes three, with hyaline borders, placed at irregular intervals at a distance from the border greater than their diameter, indistinctly granular. Diameter 86 μ. [FIG. 4.]

TYPE LOCALITY: Savin Rock, Connecticut.

DISTRIBUTION: marine; known from the type locality only.

The granulation of the surface is somewhat similar to that of *A. pulvinatus* Grun. or *A. Le Tourneurii* Brun, except at the border.

Dimerogramma intermedium sp. nov.

Valves rhombic-lanceolate. Pseudoraphe indistinct. Striae ten in 10 μ, moniliform. Apices indistinctly punctate. Length of valve 35 μ. [FIG. 11.]

TYPE LOCALITY: Campeche Bay, Mexico.

DISTRIBUTION: marine; known from the type locality only.

Apparently intermediate between *D. fulvum* (Greg.) Ralfs and *D. minus* (Greg.) Ralfs.

Glyphodesmis tumida sp. nov.

Valves linear, tumid in the middle, with subcuneate ends. Central and terminal nodules distinct. Pseudoraphe distinct, widened in the middle. Striæ slightly radiating at the ends, moniliform, nine in 10 μ. Length of valve 95 μ. [FIG. 2.]

TYPE LOCALITY: Campeche Bay, Mexico.

DISTRIBUTION: marine; known from the type locailty only.

Resembles *Dimerogramma marinum* (Greg.) Ralfs in outline but differs in possessing a central nodule and finer striation. It differs from *Glyphodesmis Williamsonii* (Greg.) Grun. in outline and somewhat resembles *Plagiogramma Loczyi* Pant., considered by Brun a form of *G. Williamsonii*.

Glyphodesmis campechiana sp. nov.

Valves linear-lanceolate, tumid in the middle and tapering to the subacute ends. Central pseudonodule distinct; terminal spaces ovate. Striae marginal, twelve in 10 μ, leaving a broad, lanceolate, hyaline area about half the width of the valve. Length of valve 30 μ. [FIG. 10.]

TYPE LOCALITY: Campeche Bay, Mexico.

DISTRIBUTION: marine; known from the type locality only.

Synedra anguinea sp. nov.

Frustule in zone view sigmoid at the ends. Valves linear, sigmoid at the slightly tapering, rounded ends, pseudoraphe very narrow, somewhat indefinite. Striae nine or ten in 10 μ, radiate at the ends, punctate, interrupted by a marginal line on each side. Length of valve 315 μ. [Fig. 1.]

TYPE LOCALITY: Colon, Panama.

DISTRIBUTION: marine; known from the type locality only. Rare.

Synedra incisa sp. nov.

Valves linear-lanceolate, with subcapitate ends. One or both sides more or less deeply incised. Pseudoraphe scarcely evident. Striae about eighteen in 10 μ. Length of valve 25–50 μ. [FIG. 8.]

TYPE LOCALITY: Central City, Nebraska (in a water tank).

DISTRIBUTION: fresh water; known from the type locality only, where it is abundant.

Closely resembles *Synedra affinis Baileyana* H. H. Chase (in Walker & Chase, Some New and Rare Diatoms 4. *pl. 2, f. 1*)

in outline, but the striae are not marginal. The species was sent to me by Professor C. J. Elmore, Westminster College, Missouri.

Eunotia Stevensonii sp. nov.

Valves with arcuate dorsal margin and straight or slightly concave ventral margin tumid in the middle. Apices broad and rounded. Striae ten or eleven in 10 μ, punctate. A sutural line or pseudoraphe extends between the terminal nodules as in *E. americana* Kain & Schultze, *E. Clevei* Grun. and others. Length of valve 88–113 μ. [FIGS. 12, 13.]

TYPE LOCALITY: pond near Lake Sunapee, New Hampshire.

DISTRIBUTION: fresh water (fossil), in the Monmouth, Maine, peat deposit.

I take pleasure in naming this species after Mr. William C. Stevenson, Jr., mycologist, of Philadelphia, to whom I am indebted for numerous specimens.

NAVICULA ATTWOODII M. Perag. in Tempère, Diatomées du monde entier 100. 1915.

Valves linear-elliptical, with broad, rounded ends. Median line linear, narrow. Median pores somewhat incrassate. Terminal fissures indistinct. Striae finely lineate, ten to twelve in 10 μ, radiate in the middle, slightly convergent at the ends, interrupted in the middle by a broad expanding fascia reaching the margin. Length of valve 40–50 μ. [FIG. 9.]

TYPE LOCALITY: Quinnipiac, Connecticut.

DISTRIBUTION: marine; Baldwin's Creek, Long Island, and vicinity.

I had considered this form as new but Mr. Robert Hagelstein, who has collected numerous specimens, identifies it as Peragallo's species which, I believe, has not been figured.

Pinnularia Hagelsteinii sp. nov.

Valves rhombic-lanceolate, with produced, rounded ends. Striae marginal, absent from the middle of the valve, radiate in the middle, convergent at the ends, about twelve in 10 μ. Length of valve 60 μ. [FIG. 7.]

TYPE LOCALITY: near Bliss, Idaho.

DISTRIBUTION: fresh water (fossil), known from the type locality only; rather rare.

This form, of which several specimens have been found, occurs in material sent me by Mr. Robert Hagelstein, of Mineola, Long Island, after whom I take pleasure in naming it.

Nitzschia semicostata sp. nov.

Valves constricted in the middle, cuneate and acute at the ends. Longitudinal fold well defined. Keel puncta seven in 10 μ, extended into coarse costae to half the width of the valve, to 10 μ in length. Striae fourteen in 10 μ, punctate. Length of valve 115 μ. [FIG. 6.]

TYPE LOCALITY: Campeche Bay, Mexico.

DISTRIBUTION: marine; known from the type locality only; rare.

Near *N. subcostata* Grun., from which it differs chiefly in the length of the costae.

Surirella Palmeri sp. nov.

Frustule subcuneate, rounded at the ends. Valves ovate-oblong. Median line well defined. Costae three in 10 μ, reaching the median line, indistinct. Near the broad end of the valve a thin, triangular, fin-like blade, about 10 μ in length, ending in a sharp point, extends somewhat obliquely from the median line. Length of valve 108 μ. [FIGS. 14, 15.]

TYPE LOCALITY: Wawaset, Pennsylvania.

DISTRIBUTION: fresh water, known from the type locality only, where it is not rare.

I take pleasure in naming this form after Mr. T. Chalkley Palmer, of Media, Pennsylvania, who discovered it.

Kitton* has described and figured *Surirella Capronii* as resembling *S. splendida* (Ehrenb.) Kütz. in outline and costae but differing in possessing at one or both ends a "nipple-like process," hollow at the base, "with a short spine on the apex." In the present species the valve resembles *S. tenera* Greg. in outline and costae, while the process is quite different from that of *S. Capronii* Kitton.

In certain species of *Surirella* valves occur with a plasma pore, not, however, on the median line. The pore appears to serve as a medium of attachment to surrounding objects and would prevent the usual slow movement of the frustule. Whether the function

* Science Gossip 5: 61. 1869.

of the fin-like blade, acting as an anchor, serves a similar purpose, is a question.

ABNORMAL FORM OF AULACODISCUS OREGONUS Harv. & Bail.

In an article entitled, "*Aulacodiscus oregonus* with two centres," Dr. Christopher Johnston* describes and illustrates a form which he considers "as an evidence of the action of an excessive developmental potency." In normal forms of *A. oregonus* the processes, although variable in number, are symmetrically arranged near the border. In a specimen discovered by Mr. William C. Stevenson, Jr., of Philadelphia, in recent material from Monterey Bay, California, the valve is divided, somewhat asymmetrically, into six parts, each of which contains a hyaline centre and processes with more or less evident furrows. The form may be abnormal but Mr. H. C. Wheeler, of Montreal, has sent me two specimens mounted from material from Port Townsend, Washington, one of which somewhat resembles Mr. Stevenson's form, which is illustrated in FIG. 5, while the other is symmetrically divided into two parts separated by a hyaline space, with processes disposed regularly on each side exactly as in Johnston's form. Whether these specimens are evidences of the formation of gonidia may be a question, but they appear to be too numerous to be considered as mere abnormalities. It is to be noted that numerous valves occur in rich gatherings much smaller than the normal valve and of uniform size, equal to that of the partially formed valves in the specimen figured. In each of the specimens examined the internal finely granular plate described by Mr. R. C. Greenleaf† is distinctly shown, but its function in the formation of new valves is problematical.

* Am. Jour. Micros. 1: 82. 1876.
† Mo. Micros. Jour. 2: 326. 1869.

Explanation of plate 2

The figures are all magnified 600 diameters.

FIG. 1. *Synedra anguinea* Boyer.
FIG. 2. *Glyphodesmis tumida* Boyer.
FIG. 3. *Auliscus floridanus* Boyer.
FIG. 4. *Auliscus hyalinus* Boyer.
FIG. 5. *Aulacodiscus oregonus* Harv. & Bail., abnormal form.
FIG. 6. *Nitzschia semicostata* Boyer.
FIG. 7. *Pinnularia Hagelsteinii* Boyer.
FIG. 8. *Synedra incisa* Boyer.
FIG. 9. *Navicula Attwoodii* M. Perag.
FIG. 10. *Glyphodesmis campechiana* Boyer.
FIG. 11. *Dimerogramma intermedium* Boyer.
FIGS. 12, 13. *Eunotia Stevensonii* Boyer.
FIGS. 14, 15. *Surirella Palmeri* Boyer.

The wood of Machaerium Whitfordii*

ROBERT B. MILLER

(WITH EIGHT TEXT FIGURES)

MATERIAL

The specimen of wood described in this paper is from the type tree of a recently described species of *Machaerium*, known as *Machaerium Whitfordii* Macbride, and is No. 415 in the collections of the Yale School of Forestry. It was collected in the forest along the Negro River in Colombia, in July, 1917, by Dr. H. N. Whitford. The tree, according to the collector, is fairly common in the high hills of Colombia, attains a height of about 20 meters and is of commercial importance. The natives call it "negrillo," a name suggested by the dark color of the heartwood and not restricted to this species. It "belongs to the section *Oblonga* and is most closely related to *M. Moritzianum* Benth. and *M. sordidum* Benth."† It is related also to the true rosewoods of commerce.

The purpose of this paper is to supplement the botanical description of Macbride with a study of the wood structure. The wood presents some interesting features of value for diagnostic purposes. Unfortunately there is no authentic material of other species of *Machaerium* wood available with which to compare the new species.

GROSS AND LENS CHARACTERS

The wood of *Machaerium Whitfordii* is very hard and compact, without pronounced taste or odor, fine and uniform in texture, more or less cross-grained but apparently of good cabinet qualities. The sapwood, which in this specimen is 13–25 mm. thick, is cream-colored, while the heartwood, which suggests black walnut in color, varies from chocolate-brown to black, and is streaked. The line

* Contribution from the Yale School of Forestry, No. 9.

† Macbride, J. F. Contr. Gray Herb. II. 56: 53. 1918.

of demarcation between heartwood and sapwood is irregular both in general outline and detail and is independent of the concentric rings of growth.

The following figures show the comparative density of heartwood and sapwood after being dried to a constant weight at a temperature of 100° C. The greater density of the heartwood is

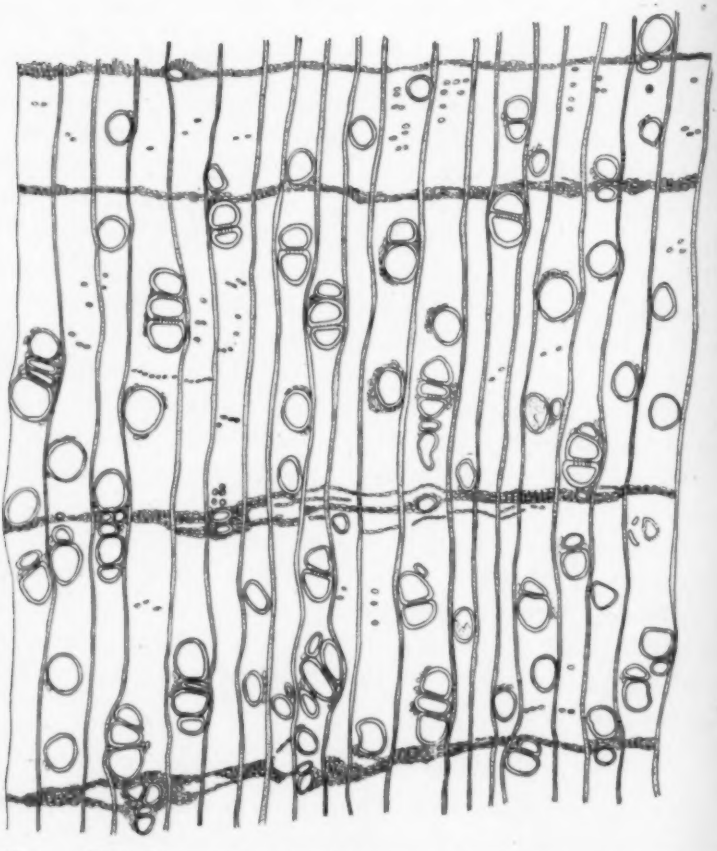


FIG. 1. Plan of cross-section showing four lines of terminal parenchyma limiting growth rings; also paratracheal and diffuse parenchyma.

due to infiltrations and, especially, to gum deposits in the vessels and parenchyma cells.

(1) All heartwood 1.118
(2) Five-sixths heartwood 1.108
(3) All sapwood ..... .975

Growth rings (FIG. 1), which presumably do not correspond to annual periods, are visible and are demarcated by terminal wood parenchyma which forms a single or sometimes double or triple line. These rings exhibit considerable variation in width. The pores are numerous, solitary or in small groups (usually radial), diffused irregularly throughout the ring or, occasionally, in echelon arrangement. They are of fairly uniform size throughout and are barely visible to the unaided eye.

The rays are not visible on the cross section without a lens. They are numerous, fine and uniform. On the tangential section they are seen (under the lens) to be of equal height and arranged in horizontal seriation, thus giving rise to fine and uniform transverse lines, the so-called "ripple marks," which, in proper light, may be seen with the unaided eye.

The bark of the specimen studied is 1.5–2 mm. in thickness and is composed of numerous fine uniform concentric laminations. The outer surface is of a grayish brown color, finely granular, smoothish, with occasional small flakes. The inner surface is somewhat ribbed vertically to correspond with the small irregularities on the outer face of the wood, and exhibits "ripple marks" very distinctly under the lens.

MINUTE ANATOMY

Vessels.—The vessels in cross section (pores) are circular, elliptical or oval in shape; some of them, as a result of crowding in groups, appear to be subdivided radially (FIG. 2). When elliptical, the tangential diameter is 0.075–0.09 mm. and the radial 0.10–0.12 mm. The thickness of the walls varies from 3 μ to 15 μ,

The vessels are without tyloses. Gummy contents, which are light-colored and not very pronounced in the sapwood, are dark brown and conspicuous in the heartwood, often completely filling entire segments. This material is sparingly soluble in hot water and insoluble in alcohol, though shrinking slightly upon dehydration. It appears unaffected by hydrofluoric acid.

The vessel segments are mostly straight, with slight constrictions at each end, the perforations are simple, the annular ridge is narrow, and the plane of contact is horizontal or slightly oblique. The segments are of nearly uniform length, mostly 0.20–0.21 mm., and are arranged in horizontal seriation.

The only markings on the walls are the pits. Those between two vessels are alternate, that is, in diagonal rows, and rarely so crowded as to give a hexagonal outline to the border. The width of these pits averages about 45 μ, while that of the pit mouth, which is narrowly elliptical, is about 30 μ (FIG. 3). Pits in transverse section show rather long and narrow canals, which widen

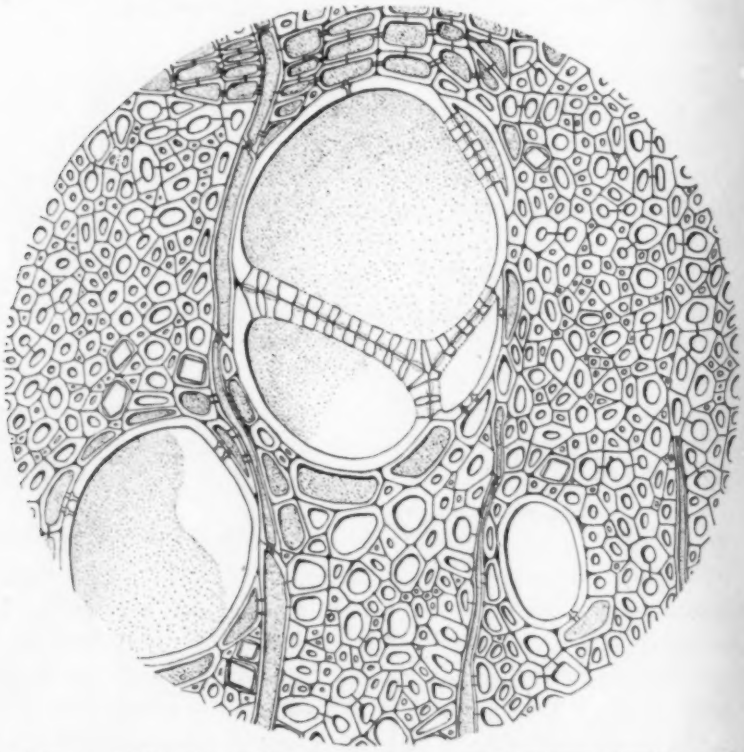


FIG. 2. Detail of a portion of cross-section greatly enlarged showing vessels, solitary and grouped; wood parenchyma, paratracheal, diffuse and terminal; crystals; rays with gummy contents; wood fibres, thick-walled and irregularly disposed. The bordered pits between vessels have slit-like mouths which, in cross-section, are almost as wide as the pit membranes.

abruptly into the cavities along the middle lamella. Sometimes, especially near the ends of the segments, the pits appear almost scalariform in surface view, due to the fact that the orifices on opposite sides of the wall are seen to overlap slightly at the ends into what looks like a continuous slit. In surface view the pit

membranes exhibit a peculiar dotted appearance quite distinct under the low power. These are due to sieve-like perforations, first described by Jönsson* in various woods of the Leguminosae and certain other families.

Tracheids.—Typical tracheids, i.e. with pointed and overlapping ends, are apparently absent. At intervals in the smallest vessels, however, it is not uncommon to find cells corresponding in every way to segments except that the ends are pitted instead of perforated. Intermediate forms with one end perforated and the other closed, except for bordered pits, are occasionally met with.

Wood fibers.—Libriform wood fibers (FIG. 4) form the ground mass of the wood. Their average length is 0.68 mm., the width of the median portion about 15 μ, and the thickness of the wall about 2.5 μ. The lumina are narrow and nonseptate. In cross section (FIG. 2) the fibers, which are polygonal in outline, appear crowded together without regular arrangement, but upon close inspection there is usually seen a fairly definite arrangement between the larger cavities (the enlarged portions of the fibers) and the smaller ones (the dove-tailing tips), due to the fact that the fibers are storied.

The pits are slit-like or narrowly lenticular, either simple or inconspicuously bordered. They are often aggregated in groups of seven to eight at the projecting "shoulder" of the fibers, midway between vertical ray tiers; see FIGS. 4 and 5. These localized pit areas, which may be seen in both longitudinal sections, serve to make the "ripple marks" more distinct. This feature has already been noted by Record† and corresponds to the condition observed by Von Höhnel‡ in a few woods, notably *Bocoa provacensis* Aubl. (*Inocarpus edulis* Forst.).

Wood parenchyma.—Wood parenchyma occurs in three arrangements: (1) as isolated strands scattered in the prosen-

* Jönsson, B. Siebänliche Poren in den trachealen Xylemelementen der Phanerogamen, hauptsächlich der Leguminosen. Ber. Deuts. Bot. Ges. **10**: 494–513. 1892.

† Record, S. J. Storied or tier-like structure of certain dicotyledonous woods. Bull. Torrey Club **46**: 253–273. 1919.

‡ Höhnel, F. von. Ueber stockwerkartig aufgebaute Holzkörper. Sitzb. Math. Naturw. Cl. Akad. Wiss. Wien **89**: 30–47. 1884.

chymatous ground mass, i.e. diffuse; (2) as a layer surrounding the vessels, i.e. paratracheal, but not forming conspicuous masses; (3) in concentric lines or bands, two to seven (mostly two to four) cells wide, sometimes dividing into two or three closely spaced lines for greater or less distances, and apparently limiting seasonal growths; see FIG. 1.

The parenchyma strands are 0.20–0.21 mm. in length, or nearly the same as that of the vessel segments with which they

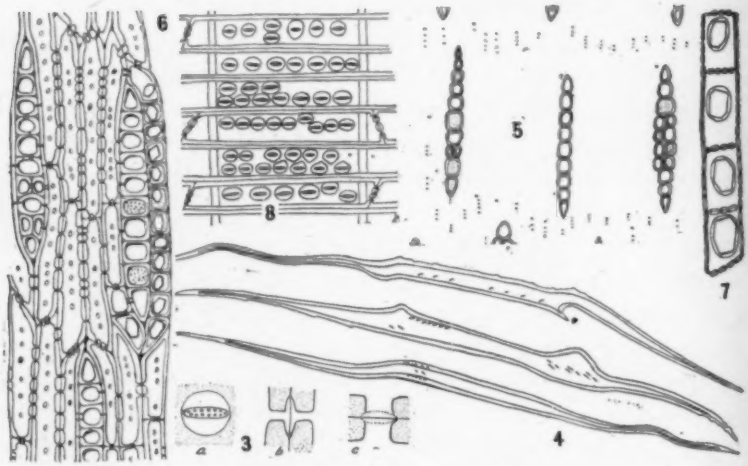


FIG. 3. Diagram of pits between vessels: *a*, surface view, showing rounded border, horizontal elongated mouth, and sieve-like perforations of pit membrane; *b*, vertical section of pit showing narrow canal, *c*, transverse section of pit showing canal almost as wide as the membrane.

FIG. 4. Various forms of wood fibers showing simple pits, which are often aggregated at the shoulders of the fibers.

FIG. 5. Sketch of tangential section showing narrow, mostly uniseriate, rays in horizontal seriation and with special pit areas between the tiers.

FIG. 6. Tangential section through terminal parenchyma, showing the rays and parenchyma strands in seriation; also chambered parenchyma with crystals.

FIG. 7. Detail of chambered parenchyma showing crystals with gelatinous covering.

FIG. 8. Radial section, showing homogeneous ray and the character of the pitting. The pits into the vessel are half-bordered and show sieve-like structure.

are in seriation. The number of cells per strand is usually two, though not infrequently three. The individual cells of the strand are not in secondary seriation (FIG. 6). The average width of a wood parenchyma cell, tangential section, is 17.5 μ; the wall is 2.5 μ thick and abundantly pitted.

Chambered parenchyma strands, with eight to fourteen crystal-bearing cells per strand, are common. The crystals (FIG. 7) are rhombohedral, measuring about 10 μ high and 7.5 μ wide. They appear to be surrounded by a gelatinous coat or layer, which may protect them to some extent from the action of nitric acid, since they are found in macerated material.

Rays.—The rays (FIGS. 5 and 6), as seen in tangential section, are in horizontal seriation, uniform, mostly uniseriate (occasionally biseriate in part), and from eight to twelve cells high. They measure 0.9–0.15 mm. in height and about 15 μ in width at the median portion.

In radial section the rays (FIG. 8) are homogeneous, and the cells are rectangular, 0.075–0.087 mm. in length and about 12.5 μ high. The marginal cells are regular in form and procumbent like the others making up the ray. The walls between adjacent ray cells are finely and abundantly pitted. The lateral walls, where in contact with vessels, exhibit numerous small bordered pits (structurally half-bordered), which are arranged in two horizontal rows, one or two to each cell. The mouth of the pit is narrowly lenticular and the membrance distintly perforated. In the heartwood the ray cells are very gummy, the gum being collected at the cross walls between cells, or along the inner side of the cell wall.

SUMMARY

1. *Machaerium Whitfordii* is a species of Colombian tree recently described by MacBride. The wood is related to the true rosewoods, appears to have good cabinet qualities, and is of commerical importance. The specific gravity of the heartwood (oven-dry) is about 1.20.

2. The wood is characterized by its very fine texture, its dark variegated color, the fine lines of terminal parenchyma, the storied arrangement of its elements (including localized pit areas on the fibers), its homogeneous and usually uniseriate rays, the presence of small half-bordered pits between vessels and ray cells, and the sieve-like perforations of the pit membrane.

Acknowledgment is made to Professor Samuel J. Record of Yale University, under whose direction this study was made, and also to Dr. Forest B. H. Brown for assistance in technique.

UNIVERSITY OF ILLINOIS.

INDEX TO AMERICAN BOTANICAL LITERATURE

1917-1919

The aim of this Index is to include all current botanical literature written by Americans, published in America, or based upon American material; the word America being used in the broadest sense.

Reviews, and papers that relate exclusively to forestry, agriculture, horticulture, manufactured products of vegetable origin, or laboratory methods are not included, and no attempt is made to index the literature of bacteriology. An occasional exception is made in favor of some paper appearing in an American periodical which is devoted wholly to botany. Reprints are not mentioned unless they differ from the original in some important particular. If users of the Index will call the attention of the editor to errors or omissions, their kindness will be appreciated.

This Index is reprinted monthly on cards, and furnished in this form to subscribers at the rate of one cent for each card. Selections of cards are not permitted; each subscriber must take all cards published during the term of his subscription. Correspondence relating to the card issue should be addressed to the Treasurer of the Torrey Botanical Club.

Arthur J. C., & Mains, E. B. Grass rusts of unusual structure. Bull. Torrey Club **46**: 411–415. *f. 1, 2.* 5 N 1919.
Puccinia phakopsoroides sp. nov. is described.

Berry, E. W. Age of certain plant-bearing beds and associated marine formations in South America. Bull. Geol. Soc. Am. **29**: 637–648. *f. 1.* 30 D 1918.

Berry, E. W. Paleogeographic significance of the Cenozoic floras of equatorial America and the adjacent regions. Bull. Geog. Soc. Am. **29**: 631–636. 30 D 1918.

Berry, E. W. The upper Cretaceous Mississippi Gulf. Sci. Mo. 130–144. *f. 1–6.* Au 1919.

Bicknell, E. P. The ferns and flowering plants of Nantucket—XX. Bull. Torrey Club **46**: 423–440. 8 D 1919.

Bitter, G. *Solana* nova vel minus cognita—XVII. Rep. Spec. Nov. **16**: 10–15. 31 Au 1919.
Three new species from South America are described.

Bödeker, F. *Echinocactus Joossensianus* Böd. spec. nov. Monats. Kakteenk. **28**: 38–44. 1918. [Illust.]

Bödeker, F. *Mamillaria erythrosperma* Böd. spec. nov. Monats. Kakteenk. **28**: 101–105. 1918. [Illust.]

Brandegee, T. S. Plantae Mexicanae Purpusianae—IX. Univ. Calif. Publ. Bot. **6**: 497–503. 3 N 1919.

Includes the new genus *Hesperothamnus* and 17 new species in various genera.

Brandes, E. W. Banana wilt. Phytopathology **9**: 339–389. *pl. 21–34* + *f. 1–5*. 10 O 1919.

Brandes, E. W. The mosaic disease of sugar cane and other grasses. U. S. Dept. Agr. Bull. 829: 1–26. *pl. 1* + *f. 1–5*. 29 O 1919.

Briquet, J. Decades plantarum novarum vel minus cognitarum. Ann. Conserv. Jard. Bot. Genève **20**: 342–427. 15 My 1919.

Includes descriptions of 43 new species, chiefly from South America, in *Maytenus, Columellia, Clethra, Callisthene, Qualea, Vochisia, Hydrangea, Escallonia* and *Valeriana*.

Bush, B. F. The Missouri muhlenbergias—II. Am. Mid. Nat. 6: 33–49. Jl 1919; 57–77. S 1919.

Carsner, E. Susceptibility of various plants to curly-top of sugar beet. Phytopathology **9**: 413–421. *f. 1–7*. 10 O 1919.

Castillon, L. Flora Tucumana. Rev. Tucumán Ext. Univ. 1: 1–9. S 1917.

Corrêa, M. P. Fibras texteis e cellulose. i–xii + 1–276. *f. 1–70*. Rio de Janeiro. 1919.

Cook, O. F. Olneya beans. Jour. Heredity **10**: 321–331. *f. 13–17*. 15 O 1919.

C[oulter], J. M. Aaron Aaronsohn. Bot. Gaz. **68**: 388, 389. 17 N 1919. [Portrait.]

Cowgill, H. B. Cross-pollination of sugar cane. Jour. Dep. Agr. Porto Rico **3**: 1–5. Ja 1919.

Cribbs, J. E. Ecology of *Tilia americana*—I. Comparative studies of the foliar transpiring power. Bot. Gaz. **68**: 262–286. *f. 1–13*. 16 O 1919.

Dallimore, W. The Falkland Islands. Kew Bull. Misc. Inf. **1919**: 209–221. *pl. 4, 5*. 1919.

Dana, B. F. A preliminary note on foot-rot of cereals in the northwest. Science II. **50**: 484, 485. 21 N 1919.

Davis, J. J. North American Ascochytae. Trans. Wisconsin Acad. Sci. **19**: 655–670. 1919.

Davis, J. J. Notes on parasitic fungi in Wisconsin IV. Trans. Wisconsin Acad. Sci. **19**: 671–689;—V. 690–704;—VI. 705–727. 1919. [Illust.]

Twenty-two new species are described.

Day, H. A. Japanese primulas. Jour. Internat. Gard. Club **3**: 345–354. S 1919. [Illust.]

Doran, W. L. The minimum, optimum, and maximum temperatures of spore germination in some Uredinales. Phytopathology **9**: 392–402. *f. 1.* 10 O 1919.

Dupler, A. W. Staminate strobilus of *Taxus canadensis*. Bot. Gaz. **68**: 345–366. *pl. 24–26 + f. 1–22.* 17 N 1919.

Earle, F. S. The resistance of cane varieties to yellow stripe or mosaic disease. Porto Rico Dept. Agr. Bull. 19: 1–15. *f. 1.* 1919.

Ensign, M. R. Venation and senescence of polyembryonic *Citrus* plants. Am. Jour. Bot. **6**: 311–329. *f. 1–6.* 22 N 1919.

Evans, A. W. Notes on New England Hepaticae—XV. Rhodora **21**: 149–169. *pl. 26 + f. 1–14.* 28 O 1919.
Nardia obscura sp. nov. is described.

Fawcett, W., & Rendle, A. B. Notes on Jamaica plants. Jour. Bot. **57**: 312–314. N 1919.
Includes *Chaetocarpus cubensis* and *Dendroconsinsia alpina*, spp. nov.

Fedde, F. *Corydalis pauciflora* var. *Chamissonis* var. nov. aus dem nordöstlichen Amerika. Rep. Spec. Nov. **16**: 48. 16 Au 1919.

Fernald, M. L. *Coreopsis rosea* Nutt., forma *leucantha*, n.f. Rhodora **21**: 171. 28 O 1919.

Fernald, M. L. The variations of *Ranunculus repens*. Rhodora **21**: 169. 28 O 1919.

Fromme, F. D. The nematode disease of wheat in Virginia. Virginia Agr. Exp. Sta. Bull. 222: 1–12. *f. 1–4.* Au 1919.

Hall, H. M., & Goodspeed, T. H. A rubber plant survey of western North America. Univ. Calif. Publ. Bot. **7**: 159–278. *pl. 18–20 + f. 1–8.* 7 N 1919.

Harter, L. L. Sweet potato diseases. U. S. Dep. Agr. Farm. Bull. 1059: 1–24. *f. 1–15.* O 1919.

Hassler, E. *Aspicarpa, Gaudichaudia, Camarea, Janusia* adjectis nonnullis notulis de Malpighiaceis paraguariensibus. Ann. Conserv. Jard. Bot. Genève **20**: 203–214. 30 My 1918.

Hassler, E. Bromeliacearum paraguariensium conspectus. Ann. Conserv. Jard. Bot. Genève **20**: 268–341. 1 F 1919.
Eight new species in various genera are described.

Hassler, E. Ex herbario Hassleriano: Novitates paraguarienses—XXII. Rep. Spec. Nov. **16**: 25–29. 31 Au 1919.

Hassler, E. Solanaceae Austro-Americanae imprimis paraguarienses. Ann. Conserv. Jard. Bot. Genève **20**: 173–189. *f. 1–4.* 1 O 1917.
Lycianthes and *Sesseopsis*, gen. nov., are described.

Hieronymus, G. *Aspleniorum* species novae et non satis notae. Beschreibungen von neuen Arten und Bemerkungen zu älteren Arten der Gattung *Asplenium*. Hedwigia **60**: 210–266. 8 F 1919.
Eighteen new American species are described.

Hoagland, D. R. Relation of nutrient solution to composition and reaction of cell sap of barley. Bot. Gaz. **68**: 297–304. 16 O 1919.

Hochreutiner, B. P. G. Monographia generis *Anodae*. Ann. Conserv. Jard. Bot. Genève **20**: 29–68. 15 S 1916.
Three new species are described.

Hochreutiner, B. P. G. Theaceae novae. Ann. Conserv. Jard. Bot. Genève **20**: 190–194. 1 N 1917.
Ternstroemia minoriflora from Peru and *T. Hemsleyi* from Mexico, spp. nov. are described.

Hollick, A. The story of the Bartram oak. Sci. Am. **121**: 422, 429–432. 25 O 1919.

Holm, T. Studies in the Cyperaceae—XXVII. Notes on *Carex podocarpa* R. Br., *C. montanensis* Bail., *C. venustula* Holm, *C. Lemmoni* W. Boott., and *C. aequa* Clarke. Am. Jour. Sci. IV. **48**: 17–26. *f. 1–12*. Jl 1919.

Howe, I. A. November flowers in northern Vermont. Rhodora **21**: 170. 28 O 1919.

Jones, D. F. Hybrid vigor and its meaning. Sci. Am. **121**: 230, 231: 241. 6 S 1919.

Keene, M. L. Studies of zygospore formation in *Phycomyces nitens* Kunze. Trans. Wisconsin Acad. Sci. **19**: 1195–1220. *pl. 16–18*. 1919.

Kempton, F. E. Origin and development of the pycnidium. Bot. Gaz. **68**: 233–261. *pl. 17–22*. 16 O 1919.

King, C. M., *and others*. Blooming time of Iowa plants, 1918. Trans. Iowa Hort. Soc. **53**: 226–230. 1918.

Knowlton, C. H., & Deane, W. Reports on the flora of the Boston district,—XXX. Rhodora **21**: 78–83. 9 My 1919; —XXXI. Rhodora **21**: 125–128. 19 Jl 1919.

Laufer, B. Sino-Iranical Chinese contributions to the history of civilization in ancient Iran with special reference to the history of cultivated plants and products. Field Mus. Nat. Hist. Publ. 201: 185–630. 1919.

Lay, C. D., & Wheelwright, R. A check-list of plants mentioned in the Arnold Arhoretum bulletins. Landscape Arch. **10**: 1–53. O 1919.

Leon, Bro. A new Cuban *Sida*. Torreya **19**: 172, 173. 28 O 1919.
Sida Brittoni Fr. Leon sp. nov.

Levine, M. Studies on plant cancers—I. The mechanism of the formation of the leafy crown gall. Bull. Torrey Club **46**: 447–452. *pl. 17, 18.* 8 D 1919.

Lillo, M. Reseña fitogeográfica de la provincia de Tucumán. Prin. Re. Nac. Soc. Argentina Cien. Nat. Tucumán 1916: 210–232. *pl. 15–30.* 1919.
Eighteen new species in various genera are described.

Maxon, W. R. Notes on American ferns—XIV. Am. Fern Jour. **9**: 67–73. 11 O 1919.
Notholaena limitanea Maxon sp. nov. is described.

Mercier, C. A. The electrification of seeds. A revolution in agriculture. Sci. Am. **120**: 142, 143. 15 F 1919.

Merrill, E. D. New or noteworthy Philippine plants—XV. Philip. Jour. Sci. **14**: 365–457. 19 S 1919.
Includes 96 new species.

Meyer, R. *Echinopsis Mieckleyi* R. Mey. spec. nov. Monats. Kakteenk. **28**: 122–124. 1918.

Meyer, R. Verschiedenes über die Arten der Untergattung *Ancistrocactus* K. Sch. Monats. Kakteenk. **27**: 72–80. My 1919.

Mez, C. Additamenta monographica 1919. Rep. Spec. Nov. **16**: 1–10. 31 Au 1919.
Several new South American species are described.

Moore, R. A., & Halligan, C. P. Plant production. 1–428. *f. 1–120.* 1919.

Mundt, W. *Mamillaria radians* P. DC. var. *sulcata* (Eng.) K. Sch. syn. *Mam. calcarata* Eng. Monats. Kakteenk. **27**: 65, 66. My 1919. [Illust.]

Nash, G. V. Hardy woody plants of the New York Botanical Garden. Jour. N. Y. Bot. Gard. **20**: 164–167. Au 1919; 221–225. N 1919.

Nelson, J. C. A comparison of the flora of southern British Columbia with that of the state of Washington, as illustrated by the floras of Henry and Piper. Torreya **19**: 174–184. 28 O 1919.

Nuttall, Z. The flower lovers and gardeners of ancient Mexico. Jour. Internat. Gard. Club **3**: 365–379. S 1919.

Osbon, C. C. Peat in the Dismal Swamp, Virginia and North Carolina. U. S. Geol. Surv. Bull. 711–C: 41–59. *pl. 4–6.* 29 O 1919.

Pack, C. L. Central Park trees starving to death. Am. Forestry **25**: 1391–1400. O 1919. [Illust.]

Palmer, E. J. Texas Pteridophyta—I. Am. Fern Jour. **9**: 17–22. 14 Mr 1919;—II. Am. Fern Jour. **9**: 50–56. 5 Jl 1919;—III. Am. Fern Jour. **9**: 81–84. 11 O 1919.

Pammel, L. H. Recent literature on fungous diseases of plants. Trans. Iowa Hort. Soc. **53**: 185–225. 1918.

Pammel, L. H. The willows and poplars of Iowa. Trans. Iowa Hort. Soc. **53**: 163–173. 1918. [Illust.]

Pérez, B. Contribución al estudio de la *Caesalpinia melanocarpa* Griseb. (Guayacán). Publ. Univ. Tucumán **6**: 17–24. 1918.

Purpus, J. A. *Phyllocactus* (*Epiphyllum*) *chiapensis* J. A. Purp. spec. nov. Monats. Kakteenk **28**: 118–121. 1918. [Illust.]

Quehl, L. *Mamillaria Schelhasei* Pfeiff. Monats. Kakteenk. **27**: 71, 72. My 1919.

Ramaley, F. Vegetation of undrained depressions on the Sacramento plains. Bot. Gaz. **68**: 380–387. *f. 1.* 17 N 1919.

Rigg, G. B., & Thompson, T. G. Colloidal properties of bog water. Bot. Gaz. **68**: 367–379. 17 N 1919.

Roberts, H. F. Farm seeds and weeds. Kansas Agr. Bien. Rep. **21**: 284–303. *f. 133–152.* 1919.

Robinson, B. L. On tropical American Compositae, chiefly Eupatorieae. Proc. Am. Acad. Sci. **55**: 1–41. 12 N 1919.
New species are described in *Ophryosorus* (2), *Eupatorium* (37) and *Brickellia* (1).

Robinson, B. L. A recension of the Eupatoriums of Peru. Proc. Am. Acad. Sci. **55**: 42–88. N 1919.
Includes *Helogyne straminea*, comb. nov.

Sargent, C. S. Notes from the Arnold Arboretum. Jour. Internat. Gard. Club **3**: 473–488. 1919. [Illust.]

Schneider, C. Notes on American willows—VI. Jour. Arnold Arbor. **1**: 67–97. O 1919.
Salix Jepsonii and *S. delnortensis*, spp. nov., are described.

Schorger, A. W. Contribution to the chemistry of American conifers. Trans. Wisconsin Acad. Sci. **19**: 728–766. 1919.

Sears, F. C. Productive orcharding. i–xiv + 1–315. *f. 1–155.* Philadelphia. 4 Mr 1919.
Second edition, revised, contains chapter on diseases of trees.

Schuette, H. A. A biochemical study of the plankton of Lake Mendota. Trans. Wisconsin Acad. Sci. **19**: 594–613. 1918.

Schultz, E. S., *and others*. Investigations on the mosaic disease of the Irish potato. Jour. Agr. Research **17**: 247–274. *pl. A, B, 25–30.* 15 S 1919.

Shapovalov, M. Is the common potato scab controllable by a mere rotation of crops? Phytopathology **9**: 422–424. *f. 1.* 10 O 1919.

Singleton, E. Flower-names. Jour. Internat. Gard. Club **3**: 355–362. S 1919.

Small, J. K. Coastwise dunes and lagoons. Jour. N. Y. Bot. Gard. **20**: 191–207. O 1919.
"A record of botanical exploration in Florida in the spring of 1918."

Smith, C. P. Studies in the genus *Lupinus*—IV. The *Pusilli*. Bull. Torrey Club **46**: 389–410. 5 N 1919.

Smith, G. M. A second list of algae found in Wisconsin lakes. Trans. Wisconsin Acad. Sci. **19**: 614–645. *pl. 10–15.* 1918.
Includes the new genus *Planktosphaeria* and new species in *Asterococcus* (1), *Oocystis* (1), *Tetraedron* (1), *Characium* (1), *Chlorobotrys* (1) and *Planktosphaeria* (1).

Standley, P. C. A remarkable new *Geranium* from Venezuela. Jour. Washington Acad. Sci. 5: 600–602. 19 O 1915.
Geranium Johnii sp. nov.

Steinberg, R. A. A study of some factors in the chemical stimulation of the growth of *Aspergillus niger*. Am. Jour. Bot. **6**: 330–356. 20 N 1919; 357–372. 22 N 1919.

Stevens, F. L. Foot-rot disease of wheat. Historical and bibliographic. Illinois Nat. Hist. Surv. Bull. 13: 259–286. *f. 1.* O 1919.

Stevens, N. E., & Higgins, C. H. Temperature in relation to quality of sweet corn. Jour. Agr. Research **17**: 275–284. *f. 1.* 15 S 1919.

Stout, A. B. Tulip droppers. Jour. Internat. Gard. Club **3**: 463–472. 1919. [Illust.]

Stuckert, T. Contributions à la connaissance de la Flore Argentine. Ann. Conserv. Jard. Bot. Genève **20**: 428–464. 1 Je 1919.
Four new species in *Valeriana* are described.

Thellung, A. Ein neuer *Amarantus* aus dem Andinen Südamerika. Rep. Spec. Nov. **16**: 23, 24. 31 Au 1919.
Amarantus Ataco sp. nov.

Thurston, H. W., Jr. Sex in the Conjugatae and the relative frequency of the different types of conjugation. Bull. Torrey Club **46**: 441–446. 8 D 1919.

Turley, H. E. New fruit fungi found on the Chicago market. Science II. **50**: 375, 376. 17 O 1919.

Turrill, W. B. Botanical results of Swedish South American and Antarctic expeditions. Kew Bull. Misc. Inf. **1919**: 268–279. 1919.

Urban, I. Sertum antillanum—VIII. Rep. Spec. Nov. **16**: 32–42. 31 Au 1919.
Nine American species are described.

Vaupel, F. Aus der alten Kakteenliteratur. Monats. Kakteenk. **29**: 61–66. Je 1919. [Illust.]

Vaupel, F. *Echinocactus Fiebrigii* Gürke. Monats. Kakteenk. **28**: 138–141. 1918. [Illust.]

Vaupel, F. *Echinocactus Mihanovichii* Fr. et G. Monats. Kakteenk. **29**: 66. Je 1919. [Illust.]

Vinal, W. G. Mainly the pedagogy of seeds with some seeds of pedagogy. Nature-Study Rev. **15**: 213–232. *pl. 1, 2.* S 1919.

Vogel, I. H. A rose graft disease. Phytopathology **9**: 403–412. *f. 1–6.* 10 O 1919.

Vries, H. de. *Oenothera Lamarckiana erythrina*, eine neue Halbmutante. Zeits. Induk. Abs. & Vererbungslehre **21**: 91–118. Jl 1919.

Vries, H. de. *Oenothera Lamarckiana* mut. *simplex*. Ber. Deuts. Bot. Gesells. **37**: 65–73. 15 My 1919.

Vries, H. de. Uber monohybride Mutationen. Biol. Zentralb. **37**: 139–148. Mr 1917.

Wakemam, N. A. Pigments of flowering plants. Trans. Wisconsin Acad. Sci. **19**: 767–906. 1919.

Weatherwax, P. Paraffin solvents in histological work. Bot. Gaz. **68**: 305, 306. 16 O 1919.

Weingart, W. *Rhipsalis Purpusii* spec. nov. Monats. Kakteenk. **28**: 78–82. 1918. [Illust.]

Weir, J. R. Pathological marking rules for Idaho and Montana. Jour. Forestry **17**: 666–681. O 1919.

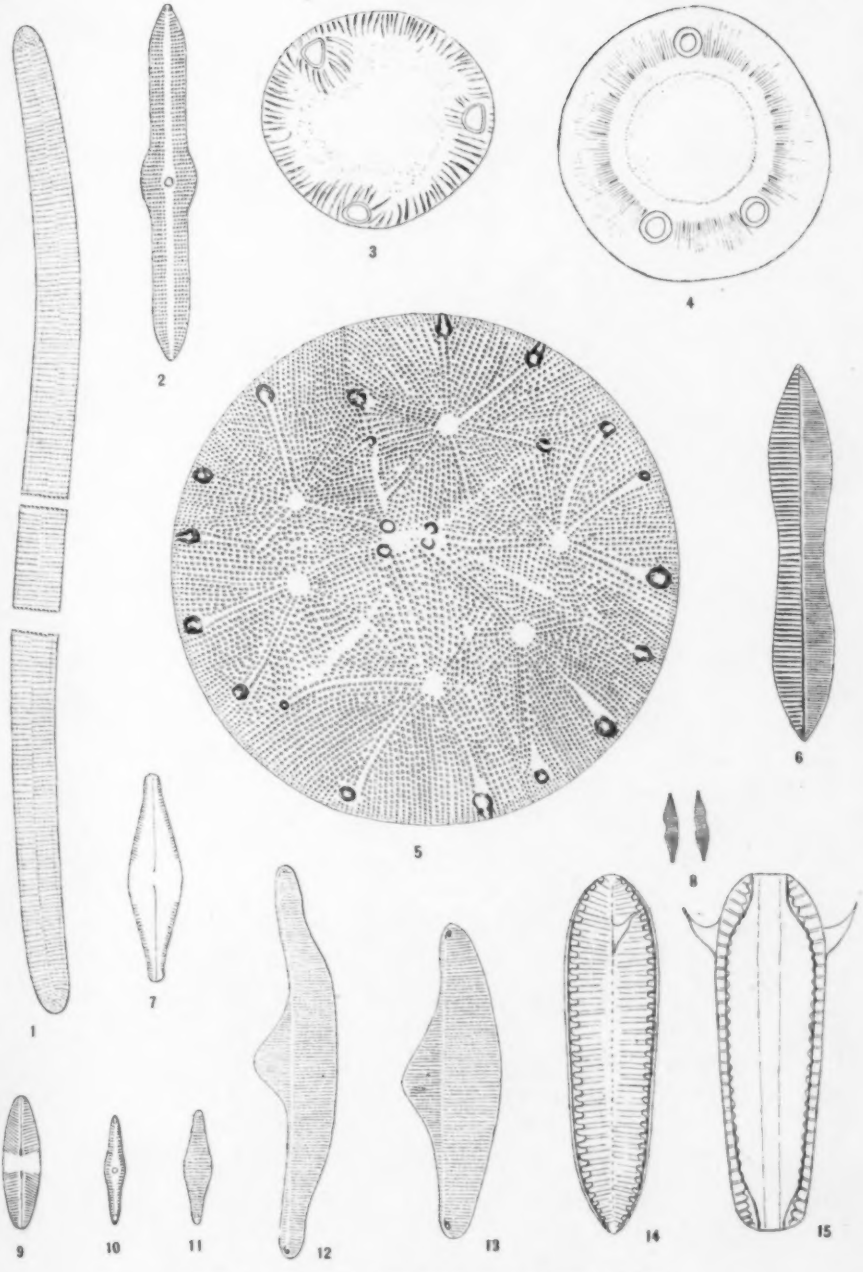
Weir, J. R., & Hubert, E. E. A study of the rots of western white pine. U. S. Dept. Agr. Bull. 799: 1–24. 10 N 1919.

Wernham, H. F. Tropical American Rubiaceae—X. Jour. Bot. (Suppl.) **57**: 17–24. Ja 1919; 25–32. F 1919; 33–44. Mr 1919.
Thirty-two new species in *Manettia* are described.

Weston, W. H. Repeated zoöspore emergence in *Dictyuchus*. Bot. Gaz. **68**: 287–296. *pl. 23* + *f. 1.* 16 O 1919.

Whetzel, H. H. George Francis Atkinson. Guide to Nature **12**: 70–72. O 1919. [Portrait.]

Whitby, S. Variation in *Hevea brasiliensis*. Ann. Bot. **33**: 313–321. Jl 1919.



BOYER: NORTH AMERICAN DIATOMACEAE